Session 8D: Harmful Algae

Questions & Answers

Frank Cox
[Question not recorded.]

A: That's an interesting question, and perhaps I will let Vera answer that, she's probably more qualified than I am on that. This is one of the disadvantages, Department of Health is a regulatory agency, we are not a research agency, so it makes it difficult for us to answer some of the most desirable questions that we have and this is one of them. In 1991, they found domoic acid in the razor clams, there was a number of people who brought in clams that they had canned in previous years and they were also found to contain some level of domoic acid. So it was here before '91, there's no doubt of that, the clams in the jars prove that. But how much toxin it was producing, when did it actually show up on the coast, I don't know. But when we detected it was after we become aware of the cormorants and pelican problem in Monterey Bay in California where those deaths occurred. And they were able to get the samples to the people at Prince Edward Island who were the world's expert on domoic acid, and they confirmed verified that yes, this was domoic acid. So it really gave us an awareness that this problem is here on the coast. But how long these cells had been there and when they started producing significant levels of toxin is anybody's guess.

Vera Trainer
A: The problem is our coast is not so accessible, and there isn't such a long-term record from our coast. But I think it's without a doubt that the organism has been there, whether the toxin has been present for many, many years is a good question. It's something that we are looking at, are there increases in toxins.

Q: Is there any correlation between the cell cycle when there's warmer water moving up the coast?

Frank Cox
A: I think that there is evidence to that, especially when the bloom occurred in Willapa and Grays Harbor. The water at Long Beach was 17 degrees centigrade in the middle of November, and it's normally down around 10, and that's almost warm enough to spawn oysters, in the middle of November. I am certain that this played some role I don't know exactly what, but what was really peculiar, we were testing razor clams because there was a razor clam beach at the town of Grayland that was open at the time. This was when we started, the razor clams at that time and during the bloom never did show any toxin. Now, we don't test razor clams, so if we had done that, they might have told us something, but normally, what we'd seen in the past, PSP would show up in the razor clams in some level but not inside Willapa Harbor. That was a very rare event. Inside both the two harbors, Grays Harbor and Willapa Harbor they both were closed so these bloom are almost like they were located inside the harbor, and as soon as we got a good heavy rain, it seemed to have flushed the blooms out, and the shellfish went back down to background levels quite quickly. I have to think that El Niño played some role in this, but I don't know exactly how much. In 1957, 40 years before this, within seven days of the bloom that occurred in '97, there was the same thing happened, and fortunately we had some of the old reports on file, and one of the old oyster farms from Willapa had told us this. That was also a El Niño year, so the two significant events in a 50-year cycle in Willapa seem to be related to these events. I have to think there is some correlation but I just don't know what.

Vera Trainer
Q: Has anybody developed a test strip for PSP toxins?

A: There have been attempts, it's a little more difficult situation because there are 20 or so analogs of PSP, so a single antibody would not recognize all of those isoforms. Domoic acid is a little more simple case, so I think that it is quite promising there. PSP, I think there a number of projects underway to try to do this kind of thing, but a suite of antibodies need to be developed, not only do the antibodies need to recognize

the toxins, but you need to have the majority of antibodies that recognize the most toxic isoforms in you test kit. So it's more difficult.

Q: What's the risk assessment of lower amounts of toxin over longer periods of time, is there a cumulative effect?

A: Yes, John Ramsdell who is at the Charleston National Marine Fisheries Service Lab has done studies in mice and he has found no cumulative effects. However, if you get a good enough slug of this stuff, it kills brain cells, and that's what I showed in that one picture. So although the effects are not thought to be cumulative, if you have repeated doses of over a period of time, you will have more and more cell death.

[Question not recorded.]

A: It's an extract. Right now, it's a methanolic extract that's run in a blender and then through a SPE column. But we are looking at trying to modify the method, maybe using a garlic press and simple extraction on the beach and then running the sample, which would be really ideal. And our hope is then that the tribes and the state might be able to run a series of samples. And we are working with the Canadian company to help them develop the test so that the cutoff level of a positive is in a good range. Because right now their cutoff is 5 ppm, and almost every single sample is positive. If their cutoff was closer to perhaps 15 ppm then fewer samples would have to be sent away for analysis, but the problem is you need to have very tight error in your measurements.

Anne Shaffer
Q: Do you think that the increase in algal mats are a possible cause of the degrading water quality or the degrading water quality the cause of these mats?

A: Good question. I think that it's both. I think that if you didn't have nutrient loading you wouldn't have them, but I think once then they actually contribute to the water quality decline.

Q: Are there any trends that have been noted in Puget Sound?

A: I'll defer to Tom. I have only looked in the strait.

Q: Looking at the trends in fecal coliform your trends in terms of algal mats, seems to be a rough match. It seem that there is something happening in the last 10 years. What locally is being done to explore some of the reasons why that is happening from a watersheds perspective?

A: Within the Dungeness watershed, yes. Like you said they did just decertify the area and so as a result had to form…they just formed Clean Water District and so now they are responding to that. That's mainly from a fecal coliform standpoint and trying to bring the shellfish back up. Clallam County and the Jamestown-Clallam, all the local players are involved in that. Specifically for ulvoids. Actually, I got a call from a landowner the other day that wanted to know if he could take a bulldozer down and bulldoze it off his beach, so that seems to be the management direction for ulvoids.

Q: From one of your pictures, it looked like there was a row of houses directly behind the area that you were showing blooms?

A: Yes. It's such a contentious issue. The septic systems. There is a certain contention that feels very strongly that's part of the contributing [factor]. There is an equal contention that says it's not, that it's seals. So yes, there's all part of the bigger analysis for this Clean Water District.

Q: Are all of these algae that we have been looking at native?

A: I will defer to Ron for that one.

Q: Are you aware of any studies going on in the other sides of the straits up in Vancouver Island or in the San Juans?

A: No, that is one of the problems with being a regional person is that I am on the ground, I'm out there, but as result I don't necessarily have the coordination support, so I don't dialogue with them, but it would be great.